

PATENT ABSTRACTS OF JAPAN

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(21)Application number : 09-105583 (71)Applicant : CITIZEN WATCH CO LTD

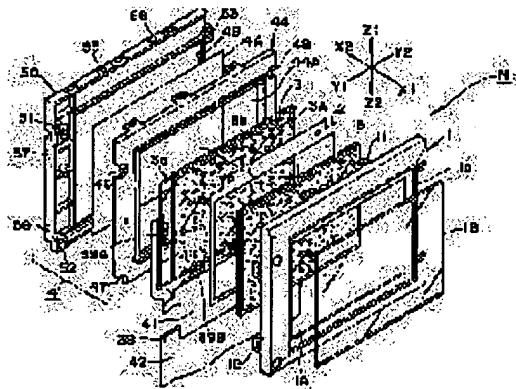
(22)Date of filing : 23.04.1997 (72)Inventor : TAKAHASHI KOTARO

(54) LIQUID CRYSTAL DISPLAY UNIT AND LIQUID CRYSTAL DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To simplify a configuration and facilitate assembly by providing an illumination rear frame with hooks for a front frame, providing the front frame with catcher for being fixed in the hooks for the front frame, fixing the catcher in the hooks for the front frame, and making an illumination unit and a liquid crystal panel into a unit.

SOLUTION: A 2nd liquid crystal display panel 3A is superimposed on a 1st liquid crystal display panel 5 via a spacer 2 and mounted in a front frame. In this case, fixing projections 55, 56 as hooks for fixing the front frame of an illumination unit 4 are fixed in fixing holes of a catcher 11 of the front frame 1, fixing projections 57, 58 as hooks for fixing the front frame of the illumination unit 4 are fixed in fixing holes of a catcher 12, and fixing projections as hooks for fixing the front frame are fixed in a catcher on the other side, respectively. And, FPC 41 connected with front side of the 2nd liquid crystal panel 3A is led out downward, and a substrate 42 is overlaid on the back of the illumination unit 4, and is secured to bosses of the illumination rear side frame 50 by screws to be made into a unit.



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CLAIMS

[Claim(s)]

[Claim 1]A lighting unit which stops after-lighting side frame of each other which stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means.

A liquid crystal display panel.

An attachment part for attaching a picture displayed on said liquid crystal display panel to an observation window and a device main frame for carrying out view **.

It is the liquid crystal display unit provided with the above, a hook for front frames was provided in a side frame after said lighting, a catcher who negotiates with said front frame at said hook for front frames was provided, and unitization of said lighting unit and said liquid crystal display panel was carried out by negotiating with said hook for front frames about said catcher.

[Claim 2]The liquid crystal display unit according to claim 1 which constituted said attachment part from an insertion hole established in a flank of a surface part in which said observation window of said front frame is located, and an insertion hole which was established in said lighting unit and allocated behind said insertion hole.

[Claim 3]The liquid crystal display unit according to claim 1 or 2, wherein a lighting unit supporter which supports said lighting unit is allocated in at least two corners of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored.

[Claim 4]In at least two sides of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored. The liquid crystal display unit according to claim 3, wherein ***** for making a projection projected from a device main frame for being arranged ahead of said front frame and supporting said liquid crystal panel penetrate is allocated in at least two places.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the liquid crystal display unit and liquid crystal display which are seen by the monitor installed in the display monitors for games and bathrooms, such as a pachinko stand, an intercom monitor, the monitor of a plant, etc.

[0002]

[Description of the Prior Art] Since a light weight, small size, a thin shape, and low power consumption are easy to be obtained compared with the display which displays a picture using the conventional Bran Ung pipe, the liquid crystal display which displays a picture with a liquid crystal display panel is used in many fields [monitor apparatus etc.] as a display.

[0003] This conventional kind of liquid crystal display screws to the adapter plate (device main frame) 88 the liquid crystal display unit 87 which stores the liquid crystal display panel 84 and the lighting unit 85 at least to the inside of the front side frame 86-1 and the back side frame 86-2 as shown in drawing 14, and profile composition has been carried out.

[0004] In this case, as shown in the front side frame 86 of said liquid crystal display unit 87 at drawing 15 and drawing 16, the lower edge part is equipped with the fitting part 81 of the shape of a piece of a couple on that surface part 80, respectively.

The back side of the surface part 80 is located in the left of the observation window 82, and the right direction, and the mounting boss part 83 has protruded on it.

It ****s in the left of the lighting unit 85, and a right-hand side part, and the hole 89 is formed.

The lighting unit 85 is attached to the front side frame 86 by screwing the screw-thread member 90 inserted in the screw-thread hole 89 to the mounting boss part 83. The liquid crystal display unit 87 screws the screw-thread member 91 inserted in the screw-thread hole 81A of the fitting part 81 to the adapter plate 88, and has attached it to the adapter plate 88.

[0005]

[Problem(s) to be Solved by the Invention] In attaching the liquid crystal display unit 87 to the adapter plate 88, if it is in the above-mentioned conventional example, are the screw clamp using the fitting part 81 provided in the front side frame 86, and it sets in assembling the liquid crystal display unit 87, The method of screwing to the mounting boss part 83 the screw-thread member 90 which inserted the attachment to the front side frame 86 of the lighting unit 85 in the screw-thread hole 89 of the lighting unit 85 is used, The composition of the mounting part to the adapter plate 88 of the liquid crystal display unit 87 became complicated compositionally, and it had the problem that attachment took a man day.

[0006] Since the space to an overhang of the fitting part 81 which the conventional liquid crystal display unit 87 has is needed, When width arranged two or more liquid crystal display units 87 in the adapter plate 88 and they were attached to it, the interval of the adjacent liquid crystal display unit 87 had to be made large, and there was a problem that attachment of more liquid crystal display units 87 could not be performed.

[0007]

[Means for Solving the Problem] A lighting unit which stops after-lighting side frame of each other in which the feature of this application for solving the above-mentioned technical problem stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame, A hook for front frames was provided in a side frame after said lighting, a catcher who negotiates with said front frame at said hook for front frames was provided, and unitization of said lighting unit and said liquid crystal display panel was carried out by negotiating with said hook for front frames about said catcher.

[0008] Said attachment part consisted of an insertion hole established in a flank of a surface part in which said observation window of said front frame is located, and an insertion hole which was established in said lighting unit and allocated behind said insertion hole.

[0009] A lighting unit supporter which supports said lighting unit is allocated in at least two corners of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored.

[0010] ***** for making at least two sides of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored penetrate a projection projected from a device main frame for being arranged ahead of said front frame and supporting said liquid crystal panel is allocated in at least two places.

[0011] A spacer was infixed in a periphery of a field where said liquid crystal display panel counters mutually in said liquid crystal unit which has at least two sheets of said liquid crystal

display panel.

[0012]Said spacer was formed by sponge. Said spacer was formed with urethane rubber or a PET material, a PC material, etc. Said spacer was formed with a nonwoven fabric. Said spacer was formed by a double faced adhesive tape.

[0013]By this composition, attach a lighting unit to a front frame, are carrying out unitization directly, without using a back side frame, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with a case of a screw clamp, and attachment becomes easy.

[0014]A lighting unit which stops after-lighting side frame of each other which stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display which attached a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame to said device main frame, Provide a hook for front frames in a side frame after said lighting, and a catcher who negotiates with said front frame at said hook for front frames is provided, An insertion hole established in a flank of a surface part in which unitization of said lighting unit and said liquid crystal display panel is carried out by negotiating with said hook for front frames about said catcher, and said observation window of said front frame is located in said attachment part, By constituting from an insertion hole which was established in said lighting unit and allocated behind said insertion hole, making said insertion hole penetrate a projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. Said device main frame was made to support said liquid crystal display unit.

[0015]By multiplying said catcher by said hook for front frames by this composition, a lighting unit is attached to a front frame and unitization is carried out. For this reason, can remove a back side frame, and composition becomes simple compared with a case where it is a screw clamp, and. When attachment attaches not only becoming easy but a liquid crystal display unit to a device main frame, An insertion hole can be made to be able to penetrate a projection projected from a device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, An excessive space to an overhang of a fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, an interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

[0016]

[Embodiment of the Invention] Hereafter, an embodiment of the invention is described based on

a drawing. Drawing 1 is a perspective view of a decomposition state in which the liquid crystal display unit concerning this invention carried out the partial abbreviation. Let [X1-X2] a longitudinal direction and Z1-Z2 be sliding directions for a cross direction and Y1-Y2 in a drawing.

[0017]Profile composition of the liquid crystal display unit N concerning this invention has been carried out from the front frame 1, the 1st liquid crystal display panel (correction cell) 5, the spacer 2 and the liquid crystal panel display unit 3 that has the 2nd liquid crystal display panel (driving cell) 3A, and the lighting unit 4. And the panels 68 (drawing 12) for devices, such as a plant, are equipped with this liquid crystal display unit N, and it is used for the monitor as a liquid crystal panel display device, for example.

[0018]The image display window part 1A of the rectangular form as an observation window is formed in the center section of the surface part 1a at said front frame 1. The windshield 1B is inserted in the front-face side of this image display window part 1A.

[0019]As shown in drawing 2 thru/or drawing 6, the front frame 1 And on the surface part 1a, Stand in a row in a margo-inferior part, and also have the left of the undersurface parts 1b and 1c and the surface part 1a, the left which stands in a row in a right-margin-of-heart part, and the right face parts 1d and 1e, and in each edge part of the upper face part 1b and the left, and the right face parts 1d and 1e. Respectively The locking piece parts 11A, 11B, 12A, 12B, and 13A of a couple, 13B is formed, the locking holes 11a, 11b, 12a, 12b, 13a, and 13b are formed in these locking piece parts 11A, 11B, 12A, 12B, 13A, and 13B, and the catchers 11, 12, and 13 consist of these.

[0020]The seat part 61 is formed in the rear-face side of the surface part 1a of said front frame 1. The bottom parts [this seat part 61 is located in back before said image display window part 1A in the rear-face side of said surface part 1a, and also] 14A and 14B, It is considered as the left of said image display window part 1A, the left located in the right direction, and the right-hand side parts 14C and 14D, The upper part part 14A and the left-hand side part 14C the corner to accomplish The 1st corner 15A, The upper part part 14A and the right-hand side part 14D the corner to accomplish The 2nd corner 15B, The bottom part 14B and the left-hand side part 14C the corner to accomplish The 3rd corner 15C, When the corner which the bottom part 14B and the right-hand side part 14D accomplish is made into the 4th corner 15D, The 1st and 2nd gage pin parts 16 and 17 to the 1st corner 15A at the 2nd corner 15B the 3rd and 4th gage pin parts 18 and 19, The 5th and 6th gage pin parts 20 and 21 are protruded on the 3rd corner 15C, the 7th and 8th gage pin parts 22 and 23 are protruded on the 4th corner 15D, respectively, and it constitutes.

[0021]The pin shape spacer part 24 protrudes on the 3rd corner 15C, the pin shape spacer parts 25 and 26 have protruded on the upper and lower sides of said left-hand side part 14C, respectively, and the pin parts 27 and 28 for an elastic spacer stop have protruded on the right

and left of said upper part part 14A.

[0022]The insertion holes 29 and 30 provide in the upper and lower sides of the left-hand side part 14C, and the insertion holes 31 and 32 are established in the upper and lower sides of the right-hand side part 14D, respectively. In a corner, three of the rear faces of the surface part 1a of the front frame 1 The holder parts 33A and 33B, 33C is provided, respectively, the lighting unit 4 is supported by these holder parts 33A, 33B, and 33C and pin shape spacer parts 24, 25, and 26, and the composition of supporting and positioning the liquid crystal panel unit 3 in the 1st - the 8th gage pin parts 16-23 is made.

[0023]Press punching of a sponge material like tabular urethane foam is carried out to the frame-like object of rectangular form, said elastic spacer 2 is fabricated, as shown in drawing 7, 35 has accomplished at least that upper section broadly and the locking holes 36 and 37 are formed in the left of 35, and the right at least for this upper section. The construction material of this elastic spacer 2 may be not only a sponge material like urethane foam but urethane rubber, and a nonwoven fabric, and may constitute elastic spacer 2 the very thing from a double faced adhesive tape.

[0024]Said liquid crystal display unit 3 is provided with the following.

Liquid crystal display panel 3A.

The drive control section 3B of the liquid crystal display panel 3A.

The liquid crystal display panel 3A encloses liquid crystal material (not shown) between the upper transparent substrate 3a and the lower transparent substrate 3b. The signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B are formed in the liquid crystal display panel 3A, respectively. And the flat cable (FPC) 41 for supplying a driving control signal to the signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B is connected to the transparent substrate of the liquid crystal display panel 3A.

[0025]The terminal connected to the 2nd liquid crystal display panel 3A and the terminal of FPC41 of an opposite hand are connected to the substrate 42 with which the electronic parts for the drive controlling of the 2nd liquid crystal display panel 3A (not shown) were mounted.

[0026]As shown in drawing 1 and drawing 8 thru/or drawing 11, the lighting unit 4 a fluorescent tube (not shown), a light guide member (not shown), the diffusion board 4B, and the prism sheet 4A, An inner surface stores to the after-lighting side frame 50 by which reflection processing was carried out, the side frame 44 before lighting which has the lighting window 44A ahead of the side frame 50 after this lighting is allocated, and the after-lighting side frame 50 and the side frame 44 before lighting of each other are stopped, and consist of locking means (a hook and a catcher).

[0027]And the notches 46, 47, 48, and 49 are formed in the upper and lower sides of the side frame 44L before lighting, and the right-hand side part 44R, respectively. The heights 51, 52, 53, and 54 of the shape corresponding to said notches 46, 47, 48, and 49 are formed in the

upper and lower sides left-hand side and on the right-hand side of the front part of the side frame 50 after said lighting, respectively. And the insertion holes 51a, 52a, 53a, and 54a are formed in these heights 51, 52, 53, and 54, and the reverse side of the heights 51, 52, 53, and 54 is accomplished to the screw-thread seat 51b, 52b, 53b, and 54b. The three boss sections 43 for screwing the substrate 42 are formed in the rear face of the side frame 50 after said lighting.

[0028]The lock projections 55 and 56 as a hook for a front frame stop are formed in right and left, you make it located in the left of the after-lighting side frame 50, and the right end surface parts 50C and 50D up and down, and the lock projections 57, 58, 59, and 60 as a hook for a front frame stop are formed in the upper bed surface part 50A of the after-lighting side frame 50 at them.

[0029]And the 1st liquid crystal display panel 5 is accommodated in the seat part 61 of the front frame 1. In this case, the 1st corner 5A of the 1st liquid crystal display panel 5 is positioned by the 1st and 2nd gage pin parts 16 and 17 of the 1st corner 15A of the front frame 1, and the 2nd corner 5B of the 1st liquid crystal display panel 5 is positioned by the 3rd and 4th gage pin parts 18 and 19 of the 2nd corner 15B. The 3rd corner 5C of the 1st liquid crystal display panel 5 is positioned by the 5th and 6th gage pin parts 20 and 21 of the 3rd corner 15C. The 4th corner 5D of the 1st liquid crystal display panel 5 is positioned by the 7th and 8th gage pin parts 22 and 23 of the 4th corner 15D.

[0030]And the spacer 2 is formed in the 1st liquid crystal display panel 5 in piles, and the insertion stop of the pin parts 27 and 28 for a spacer stop is carried out in the left of the upper part part 35 of this spacer 2, and the right locking holes 36 and 37.

[0031]And the 1st liquid crystal display panel 5 is equipped with the 2nd liquid crystal display panel 3A in piles via the spacer 2 at the front frame 1. In this case, to the locking holes 11a and 11b of the catcher 11 of the front frame 1 the lock projections 55 and 56 as a hook for a front frame stop of the lighting unit 4, The lock projections 57 and 58 as a hook for a front frame stop of the lighting unit 4 are stopped by the catcher's 12 locking holes 12a and 12b, and the lock projections 59 and 60 as a hook for a front frame stop of the ***** unit 3 are stopped by the catcher's 13 locking holes 13a and 13b, respectively.

[0032]And FPC41 connected to the side front of the 2nd liquid crystal display panel 3A is bent, and it draws caudad, The substrate 42 puts on the back side of the lighting unit 4, and ****s the fitting part (not shown) provided in the right and left of the lower edge part of the substrate 42, and it is a member. (not shown) Unitization has been screwed and carried out to the boss section 43 of the after-lighting side frame 50.

[0033]And liquid crystal display unit N by which unitization was carried out in this way is screwed to the device main frame 68. Namely, as shown in this device main frame 68 at drawing 12, the image display window part 69 of rectangular form is formed in the center

section of that surface part 68A, It is made to be located up and down, and it has protruded, the projection 70 ****s in the end face of these projections 70, and the hole 71 is formed in the left and the right-hand side part which inserted the image display window part 69 of the device main frame 68 into inside.

[0034]And the projection 70 of the device main frame 68 is inserted in the insertion holes 29, 30, 31, and 32 of the front frame 1 of liquid crystal display unit N, and liquid crystal display unit N is made to meet the back side of the device main frame 68. Next, the screw-thread seat 51b, 52b, 53b, and 54b and the screw-thread hole 71 of the end face of the projection 70 which were allocated by the after-lighting side frame 50 are screwed by the screw-thread member 72 inserted in the insertion holes 51a, 52a, 53a, and 54a allocated by the after-lighting side frame 50. Thus, liquid crystal display unit N is screwed to said device main frame 68, and a liquid crystal display is constituted. In this case, the image display window part 1A of said front frame 1 laps with the image display window part 69 of the surface part 68A of the device main frame 68.

[0035]

[Effect of the Invention]According to the liquid crystal display unit concerning this invention, like the above, the hook for front frames is provided in an after-lighting side frame, By having provided the catcher who negotiates with said hook for front frames in the front frame, and having carried out unitization of said lighting unit and said liquid crystal display panel by negotiating with said hook for front frames about said catcher, When attaching a lighting unit to a front frame and carrying out unitization, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with the case of a screw clamp, and attachment becomes easy.

[0036]The insertion hole established in the flank of the surface part in which said observation window of a front frame is located in the attachment part for attaching a liquid crystal display unit to a device main frame, By constituting from an insertion hole which was established in the lighting unit and allocated behind said insertion hole, making said insertion hole penetrate the projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. When attaching a liquid crystal display unit to a device main frame by having made said device main frame support said liquid crystal display unit, An insertion hole can be made to be able to penetrate the projection projected from the device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, The excessive space to an overhang of the fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, the interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the liquid crystal display unit and liquid crystal display which are seen by the monitor installed in the display monitors for games and bathrooms, such as a pachinko stand, an intercom monitor, the monitor of a plant, etc.

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PRIOR ART

[Description of the Prior Art] Since a light weight, small size, a thin shape, and low power consumption are easy to be obtained compared with the display which displays a picture using the conventional Bran Ung pipe, the liquid crystal display which displays a picture with a liquid crystal display panel is used in many fields [monitor apparatus etc.] as a display.

[0003] This conventional kind of liquid crystal display screws to the adapter plate (device main frame) 88 the liquid crystal display unit 87 which stores the liquid crystal display panel 84 and the lighting unit 85 at least to the inside of the front side frame 86-1 and the back side frame 86-2 as shown in drawing 14, and profile composition has been carried out.

[0004] In this case, as shown in the front side frame 86 of said liquid crystal display unit 87 at drawing 15 and drawing 16, the lower edge part is equipped with the fitting part 81 of the shape of a piece of a couple on that surface part 80, respectively.

The back side of the surface part 80 is located in the left of the observation window 82, and the right direction, and the mounting boss part 83 has protruded on it.

It ****'s in the left of the lighting unit 85, and a right-hand side part, and the hole 89 is formed. The lighting unit 85 is attached to the front side frame 86 by screwing the screw-thread member 90 inserted in the screw-thread hole 89 to the mounting boss part 83. The liquid crystal display unit 87 screws the screw-thread member 91 inserted in the screw-thread hole 81A of the fitting part 81 to the adapter plate 88, and has attached it to the adapter plate 88.

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EFFECT OF THE INVENTION

[Effect of the Invention]According to the liquid crystal display unit concerning this invention, like the above, the hook for front frames is provided in an after-lighting side frame, By having provided the catcher who negotiates with said hook for front frames in the front frame, and having carried out unitization of said lighting unit and said liquid crystal display panel by negotiating with said hook for front frames about said catcher, When attaching a lighting unit to a front frame and carrying out unitization, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with the case of a screw clamp, and attachment becomes easy.

[0036]The insertion hole established in the flank of the surface part in which said observation window of a front frame is located in the attachment part for attaching a liquid crystal display unit to a device main frame, By constituting from an insertion hole which was established in the lighting unit and allocated behind said insertion hole, making said insertion hole penetrate the projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. When attaching a liquid crystal display unit to a device main frame by having made said device main frame support said liquid crystal display unit, An insertion hole can be made to be able to penetrate the projection projected from the device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, The excessive space to an overhang of the fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, the interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] In attaching the liquid crystal display unit 87 to the adapter plate 88, if it is in the above-mentioned conventional example, are the screw clamp using the fitting part 81 provided in the front side frame 86, and it sets in assembling the liquid crystal display unit 87, The method of screwing to the mounting boss part 83 the screw-thread member 90 which inserted the attachment to the front side frame 86 of the lighting unit 85 in the screw-thread hole 89 of the lighting unit 85 is used, The composition of the mounting part to the adapter plate 88 of the liquid crystal display unit 87 became complicated compositionally, and it had the problem that attachment took a man day.

[0006] Since the space to an overhang of the fitting part 81 which the conventional liquid crystal display unit 87 has is needed, When width arranged two or more liquid crystal display units 87 in the adapter plate 88 and they were attached to it, the interval of the adjacent liquid crystal display unit 87 had to be made large, and there was a problem that attachment of more liquid crystal display units 87 could not be performed.

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MEANS

[Means for Solving the Problem]A lighting unit which stops after-lighting side frame of each other in which the feature of this application for solving the above-mentioned technical problem stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame, A hook for front frames was provided in a side frame after said lighting, a catcher who negotiates with said front frame at said hook for front frames was provided, and unitization of said lighting unit and said liquid crystal display panel was carried out by negotiating with said hook for front frames about said catcher.

[0008]Said attachment part consisted of an insertion hole established in a flank of a surface part in which said observation window of said front frame is located, and an insertion hole which was established in said lighting unit and allocated behind said insertion hole.

[0009]A lighting unit supporter which supports said lighting unit is allocated in at least two corners of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored.

[0010]***** for making at least two sides of a stowage of said front frame where said liquid crystal display panel and said lighting unit are stored penetrate a projection projected from a device main frame for being arranged ahead of said front frame and supporting said liquid crystal panel is allocated in at least two places.

[0011]A spacer was infix in a periphery of a field where said liquid crystal display panel counters mutually in said liquid crystal unit which has at least two sheets of said liquid crystal display panel.

[0012]Said spacer was formed by sponge. Said spacer was formed with urethane rubber or a

PET material, a PC material, etc. Said spacer was formed with a nonwoven fabric. Said spacer was formed by a double faced adhesive tape.

[0013]By this composition, attach a lighting unit to a front frame, are carrying out unitization directly, without using a back side frame, can carry out by multiplying said catcher by said hook for front frames, and it becomes simple compositionally compared with a case of a screw clamp, and attachment becomes easy.

[0014]A lighting unit which stops after-lighting side frame of each other which stored a fluorescent tube and a light guide member at least to a side frame before lighting which has a lighting window by a locking means, It has a front frame which has an attachment part for attaching a picture displayed on a liquid crystal display panel and said liquid crystal display panel to an observation window and a device main frame for carrying out view **, In a liquid crystal display which attached a liquid crystal display unit which allocated said lighting unit and said liquid crystal display panel in said front frame to said device main frame, Provide a hook for front frames in a side frame after said lighting, and a catcher who negotiates with said front frame at said hook for front frames is provided, An insertion hole established in a flank of a surface part in which unitization of said lighting unit and said liquid crystal display panel is carried out by negotiating with said hook for front frames about said catcher, and said observation window of said front frame is located in said attachment part, By constituting from an insertion hole which was established in said lighting unit and allocated behind said insertion hole, making said insertion hole penetrate a projection projected from said device main frame, contacting said insertion hole, and screwing said lighting unit and said projection. Said device main frame was made to support said liquid crystal display unit.

[0015]By multiplying said catcher by said hook for front frames by this composition, a lighting unit is attached to a front frame and unitization is carried out. For this reason, can remove a back side frame, and composition becomes simple compared with a case where it is a screw clamp, and. When attachment attaches not only becoming easy but a liquid crystal display unit to a device main frame, An insertion hole can be made to be able to penetrate a projection projected from a device main frame, an insertion hole can be contacted, and it can carry out by screwing a lighting unit and a projection, An excessive space to an overhang of a fitting part which the conventional liquid crystal display unit has becomes unnecessary, and when width arranges two or more liquid crystal display units in a device main frame and it attaches them to it, an interval of an adjacent liquid crystal display unit is narrowed, Attachment of more liquid crystal display units can be enabled.

[0016]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on a drawing. Drawing 1 is a perspective view of a decomposition state in which the liquid crystal display unit concerning this invention carried out the partial abbreviation. Let [X1-X2] a

longitudinal direction and Z1-Z2 be sliding directions for a cross direction and Y1-Y2 in a drawing.

[0017]Profile composition of the liquid crystal display unit N concerning this invention has been carried out from the front frame 1, the 1st liquid crystal display panel (correction cell) 5, the spacer 2 and the liquid crystal panel display unit 3 that has the 2nd liquid crystal display panel (driving cell) 3A, and the lighting unit 4. And the panels 68 (drawing 12) for devices, such as a plant, are equipped with this liquid crystal display unit N, and it is used for the monitor as a liquid crystal panel display device, for example.

[0018]The image display window part 1A of the rectangular form as an observation window is formed in the center section of the surface part 1a at said front frame 1. The windshield 1B is inserted in the front-face side of this image display window part 1A.

[0019]As shown in drawing 2 thru/or drawing 6, the front frame 1 And on the surface part 1a, Stand in a row in a margo-inferior part, and also have the left of the undersurface parts 1b and 1c and the surface part 1a, the left which stands in a row in a right-margin-of-heart part, and the right face parts 1d and 1e, and in each edge part of the upper face part 1b and the left, and the right face parts 1d and 1e. Respectively The locking piece parts 11A, 11B, 12A, 12B, and 13A of a couple, 13B is formed, the locking holes 11a, 11b, 12a, 12b, 13a, and 13b are formed in these locking piece parts 11A, 11B, 12A, 12B, 13A, and 13B, and the catchers 11, 12, and 13 consist of these.

[0020]The seat part 61 is formed in the rear-face side of the surface part 1a of said front frame 1. The bottom parts [this seat part 61 is located in back before said image display window part 1A in the rear-face side of said surface part 1a, and also] 14A and 14B, It is considered as the left of said image display window part 1A, the left located in the right direction, and the right-hand side parts 14C and 14D, The upper part part 14A and the left-hand side part 14C the corner to accomplish The 1st corner 15A, The upper part part 14A and the right-hand side part 14D the corner to accomplish The 2nd corner 15B, The bottom part 14B and the left-hand side part 14C the corner to accomplish The 3rd corner 15C, When the corner which the bottom part 14B and the right-hand side part 14D accomplish is made into the 4th corner 15D, The 1st and 2nd gage pin parts 16 and 17 to the 1st corner 15A at the 2nd corner 15B the 3rd and 4th gage pin parts 18 and 19, The 5th and 6th gage pin parts 20 and 21 are protruded on the 3rd corner 15C, the 7th and 8th gage pin parts 22 and 23 are protruded on the 4th corner 15D, respectively, and it constitutes.

[0021]The pin shape spacer part 24 protrudes on the 3rd corner 15C, the pin shape spacer parts 25 and 26 have protruded on the upper and lower sides of said left-hand side part 14C, respectively, and the pin parts 27 and 28 for an elastic spacer stop have protruded on the right and left of said upper part part 14A.

[0022]The insertion holes 29 and 30 provide in the upper and lower sides of the left-hand side

part 14C, and the insertion holes 31 and 32 are established in the upper and lower sides of the right-hand side part 14D, respectively. In a corner, three of the rear faces of the surface part 1a of the front frame 1 The holder parts 33A and 33B, 33C is provided, respectively, the lighting unit 4 is supported by these holder parts 33A, 33B, and 33C and pin shape spacer parts 24, 25, and 26, and the composition of supporting and positioning the liquid crystal panel unit 3 in the 1st - the 8th gage pin parts 16-23 is made.

[0023]Press punching of a sponge material like tabular urethane foam is carried out to the frame-like object of rectangular form, said elastic spacer 2 is fabricated, as shown in drawing 7, 35 has accomplished at least that upper section broadly and the locking holes 36 and 37 are formed in the left of 35, and the right at least for this upper section. The construction material of this elastic spacer 2 may be not only a sponge material like urethane foam but urethane rubber, and a nonwoven fabric, and may constitute elastic spacer 2 the very thing from a double faced adhesive tape.

[0024]Said liquid crystal display unit 3 is provided with the following.

Liquid crystal display panel 3A.

The drive control section 3B of the liquid crystal display panel 3A.

The liquid crystal display panel 3A encloses liquid crystal material (not shown) between the upper transparent substrate 3a and the lower transparent substrate 3b. The signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B are formed in the liquid crystal display panel 3A, respectively. And the flat cable (FPC) 41 for supplying a driving control signal to the signal electrode driving circuit unit 39A and the scanning electrode driving circuit unit 39B is connected to the transparent substrate of the liquid crystal display panel 3A.

[0025]The terminal connected to the 2nd liquid crystal display panel 3A and the terminal of FPC41 of an opposite hand are connected to the substrate 42 with which the electronic parts for the drive controlling of the 2nd liquid crystal display panel 3A (not shown) were mounted.

[0026]As shown in drawing 1 and drawing 8 thru/or drawing 11, the lighting unit 4 a fluorescent tube (not shown), a light guide member (not shown), the diffusion board 4B, and the prism sheet 4A, An inner surface stores to the after-lighting side frame 50 by which reflection processing was carried out, the side frame 44 before lighting which has the lighting window 44A ahead of the side frame 50 after this lighting is allocated, and the after-lighting side frame 50 and the side frame 44 before lighting of each other are stopped, and consist of locking means (a hook and a catcher).

[0027]And the notches 46, 47, 48, and 49 are formed in the upper and lower sides of the side frame 44L before lighting, and the right-hand side part 44R, respectively. The heights 51, 52, 53, and 54 of the shape corresponding to said notches 46, 47, 48, and 49 are formed in the upper and lower sides left-hand side and on the right-hand side of the front part of the side frame 50 after said lighting, respectively. And the insertion holes 51a, 52a, 53a, and 54a are

formed in these heights 51, 52, 53, and 54, and the reverse side of the heights 51, 52, 53, and 54 is accomplished to the screw-thread seat 51b, 52b, 53b, and 54b. The three boss sections 43 for screwing the substrate 42 are formed in the rear face of the side frame 50 after said lighting.

[0028]The lock projections 55 and 56 as a hook for a front frame stop are formed in right and left, you make it located in the left of the after-lighting side frame 50, and the right end surface parts 50C and 50D up and down, and the lock projections 57, 58, 59, and 60 as a hook for a front frame stop are formed in the upper bed surface part 50A of the after-lighting side frame 50 at them.

[0029]And the 1st liquid crystal display panel 5 is accommodated in the seat part 61 of the front frame 1. In this case, the 1st corner 5A of the 1st liquid crystal display panel 5 is positioned by the 1st and 2nd gage pin parts 16 and 17 of the 1st corner 15A of the front frame 1, and the 2nd corner 5B of the 1st liquid crystal display panel 5 is positioned by the 3rd and 4th gage pin parts 18 and 19 of the 2nd corner 15B. The 3rd corner 5C of the 1st liquid crystal display panel 5 is positioned by the 5th and 6th gage pin parts 20 and 21 of the 3rd corner 15C. The 4th corner 5D of the 1st liquid crystal display panel 5 is positioned by the 7th and 8th gage pin parts 22 and 23 of the 4th corner 15D.

[0030]And the spacer 2 is formed in the 1st liquid crystal display panel 5 in piles, and the insertion stop of the pin parts 27 and 28 for a spacer stop is carried out in the left of the upper part part 35 of this spacer 2, and the right locking holes 36 and 37.

[0031]And the 1st liquid crystal display panel 5 is equipped with the 2nd liquid crystal display panel 3A in piles via the spacer 2 at the front frame 1. In this case, to the locking holes 11a and 11b of the catcher 11 of the front frame 1 the lock projections 55 and 56 as a hook for a front frame stop of the lighting unit 4, The lock projections 57 and 58 as a hook for a front frame stop of the lighting unit 4 are stopped by the catcher's 12 locking holes 12a and 12b, and the lock projections 59 and 60 as a hook for a front frame stop of the ***** unit 3 are stopped by the catcher's 13 locking holes 13a and 13b, respectively.

[0032]And FPC41 connected to the side front of the 2nd liquid crystal display panel 3A is bent, and it draws caudad, The substrate 42 puts on the back side of the lighting unit 4, and ****s the fitting part (not shown) provided in the right and left of the lower edge part of the substrate 42, and it is a member. (not shown) Unitization has been screwed and carried out to the boss section 43 of the after-lighting side frame 50.

[0033]And liquid crystal display unit N by which unitization was carried out in this way is screwed to the device main frame 68. Namely, as shown in this device main frame 68 at drawing 12, the image display window part 69 of rectangular form is formed in the center section of that surface part 68A, It is made to be located up and down, and it has protruded, the projection 70 ****s in the end face of these projections 70, and the hole 71 is formed in the

left and the right-hand side part which inserted the image display window part 69 of the device main frame 68 into inside.

[0034] And the projection 70 of the device main frame 68 is inserted in the insertion holes 29, 30, 31, and 32 of the front frame 1 of liquid crystal display unit N, and liquid crystal display unit N is made to meet the back side of the device main frame 68. Next, the screw-thread seat 51b, 52b, 53b, and 54b and the screw-thread hole 71 of the end face of the projection 70 which were allocated by the after-lighting side frame 50 are screwed by the screw-thread member 72 inserted in the insertion holes 51a, 52a, 53a, and 54a allocated by the after-lighting side frame 50. Thus, liquid crystal display unit N is screwed to said device main frame 68, and a liquid crystal display is constituted. In this case, the image display window part 1A of said front frame 1 laps with the image display window part 69 of the surface part 68A of the device main frame 68.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a perspective view of a decomposition state of the liquid crystal display unit concerning this invention.

[Drawing 2]It is a front view of the front frame of the liquid crystal display unit.

[Drawing 3] It is a view figure from [of drawing 2] A.

[Drawing 4] It is a view figure from [of drawing 2] B.

[Drawing 5] It is a view figure from [of drawing 2] C.

[Drawing 6]It is a back view of the front frame of the liquid crystal display unit.

[Drawing 7] It is a front view of the elastic spacer of the liquid crystal display unit.

[Drawing 8]It is a front view of the lighting unit of the liquid crystal display unit.

[Drawing 9] It is a view figure from [of drawing 8] D.

[Drawing 10] It is a view figure from [of drawing 91]

[Drawing 11] It is a view figure from [of drawing 91 E.

[Drawing 12] It is a perspective view of the mounting s

Drawing 17 is a perspective view of the mounting state of the liquid crystal display concerning this invention.

[Drawing 13] It is a sectional view of the mounting state of the liquid crystal display.

[Drawing 14]It is a sectional view of the conventional liquid crystal display.

[Drawing 14] It is a sectional view of the conventional liquid crystal display.

[Drawing 15] It is a perspective view of the front frame of the liquid crystal display.

Drawing 10 It is the perspective

Description of

1 Front frame

2 Elastic spacer

3 Liquid crystal display panel

- 4 Lighting unit
- 5 The 1st liquid crystal panel
- 11, 12, and 13 Catcher
- 29-32 Insertion hole
- 50 After-lighting side frame
- 51a-54a Insertion hole
- 55-60 Lock projection (hook for a front frame stop)
- 68 Device main frame
- 70 Projection
- N Liquid crystal display unit

[Translation done.]

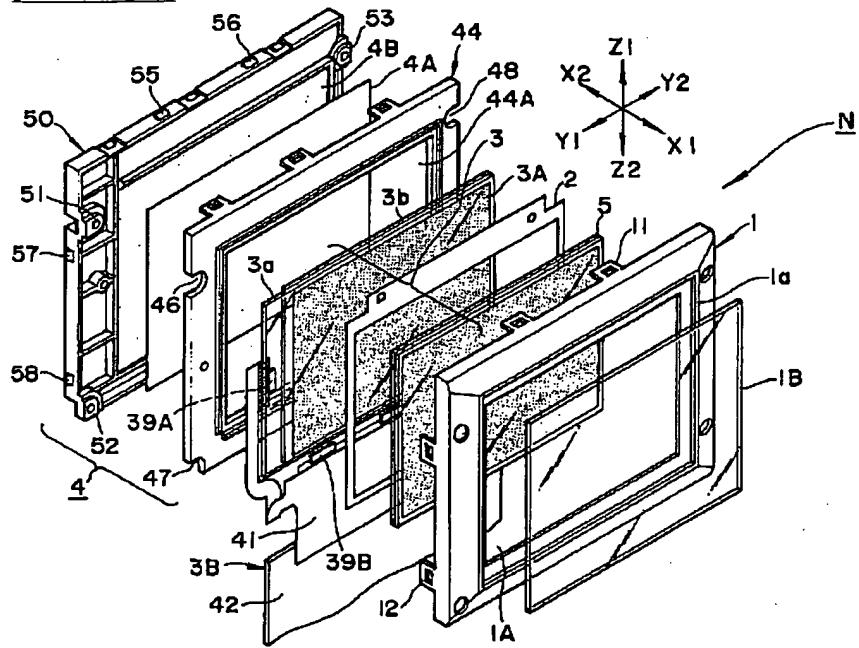
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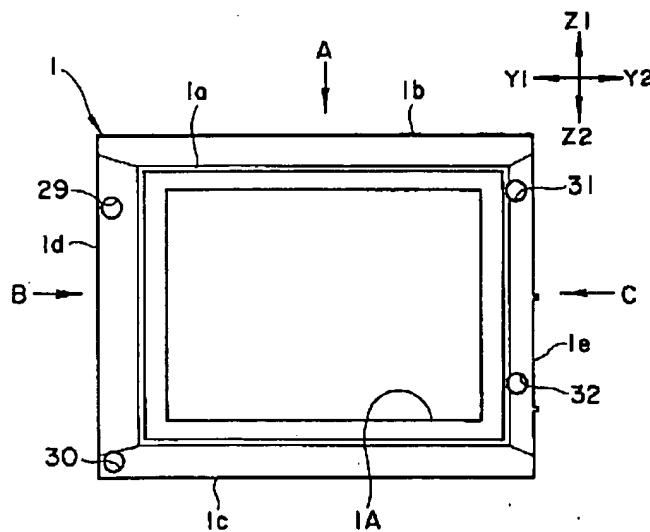
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DRAWINGS

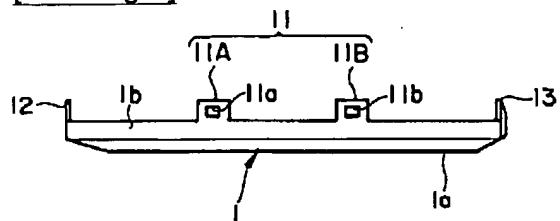
[Drawing 1]



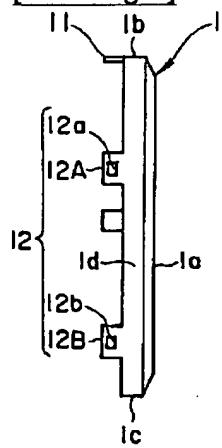
[Drawing 2]



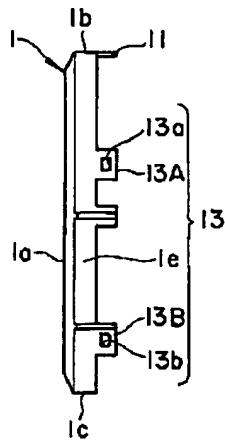
[Drawing 3]



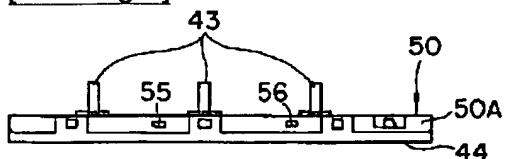
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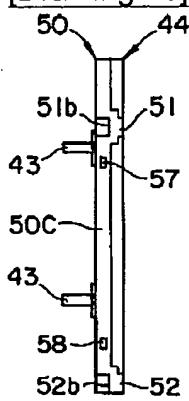
[Drawing 5]



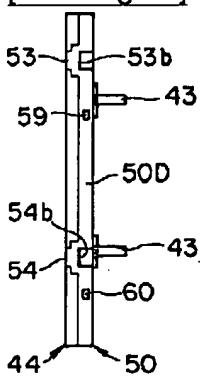
[Drawing 9]



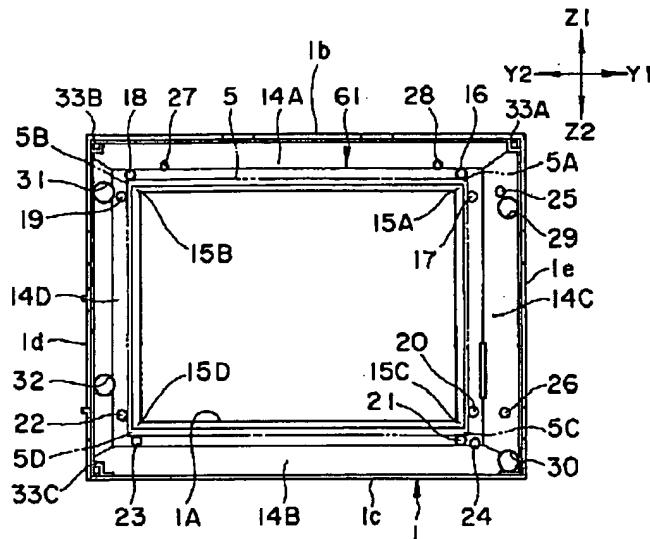
[Drawing 10]



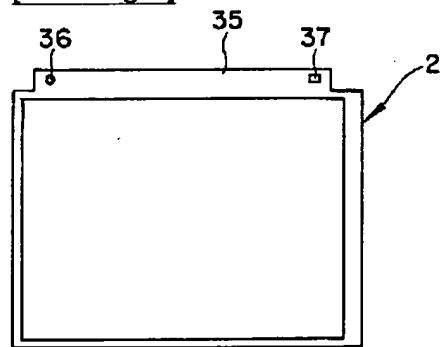
[Drawing 11]



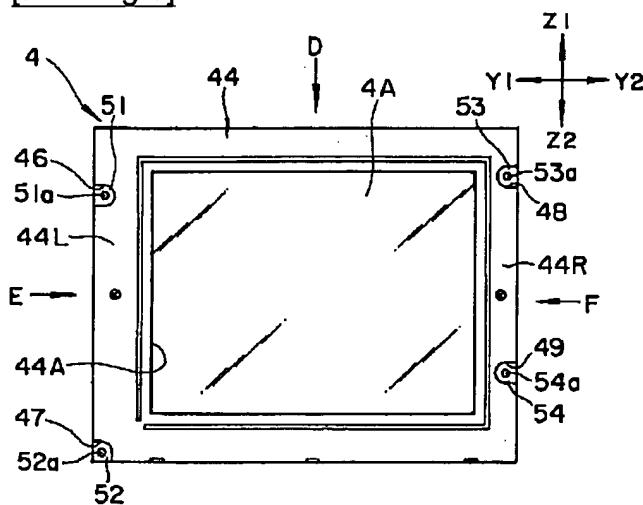
[Drawing 6]



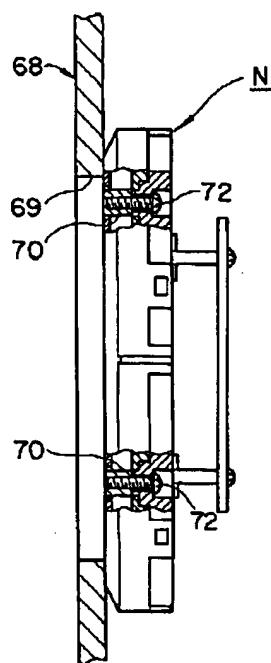
[Drawing 7]



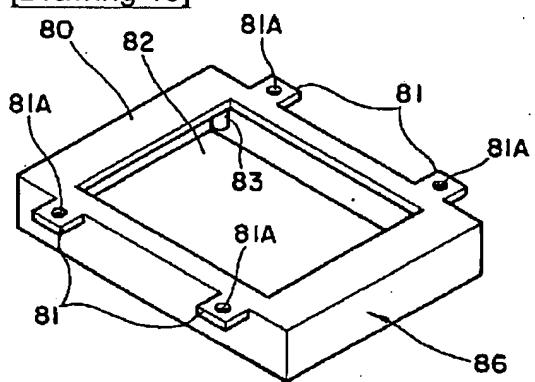
[Drawing 8]



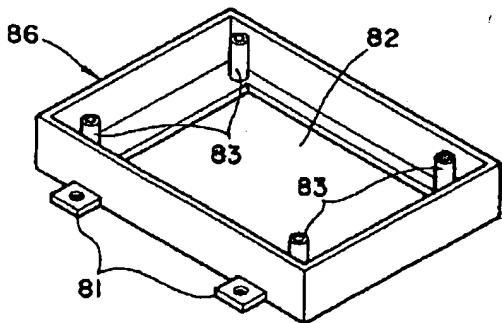
[Drawing 13]



[Drawing 15]



[Drawing 16]



[Drawing 12]

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(71)出願人 000001960

シチズン時計株式会社

東京都新宿区西新宿2丁目1番1号

(72)発明者 高橋 幸太郎

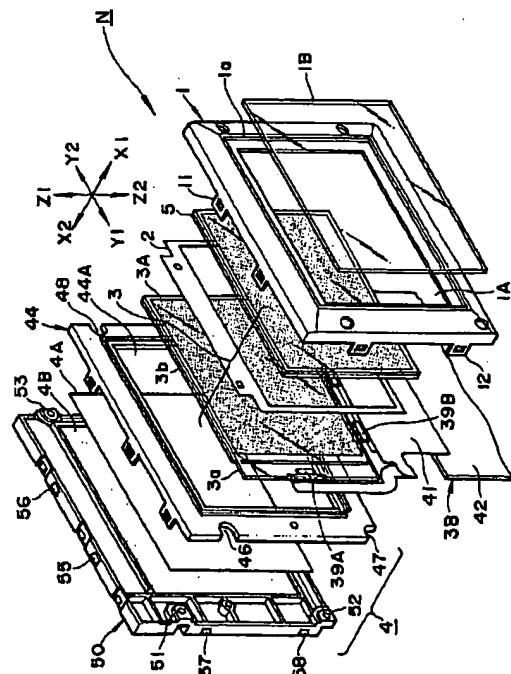
東京都田無市本町6丁目1番12号 シチズン時計株式会社田無製造所内

(54)【発明の名称】 液晶表示ユニット及び液晶表示装置

(57)【要約】

【課題】 複数の液晶表示ユニットの装置本体への取付時に、隣り合う液晶表示ユニットの間隔を狭くならずして、より多くの液晶表示ユニットの取付けを可能にする液晶表示装置を提供する。

【解決手段】 照明後側枠に係止突起55～60を設け前枠1に係止突起に掛合するキャッチャ11、12、13を設け係止突起55～60にキャッチャ11、12、13を掛けさせることにより照明ユニット4を前枠1に取付けを行い液晶表示ユニットを形成することで表示ユニットの下枠を削減する。また液晶表示ユニットNを装置本体68に取り付ける場合には、組付け部を、前枠1の挿通孔29～32と、照明ユニット4に設けられた挿入孔51a～54aとから構成し装置本体68から突出した突起70を挿通孔29～32に貫通させて挿入孔51a～54aに当接し照明ユニット4と突起70をねじ止めすることにより行う。



【特許請求の範囲】

【請求項1】 照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットにおいて、前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチを設け、前記前枠用フックに前記キャッチを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化したことを特徴とする液晶表示ユニット。

【請求項2】 前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成した請求項1に記載の液晶表示ユニット。

【請求項3】 前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも2箇所の隅には、前記照明ユニットを支持する照明ユニット支持部が配設されていることを特徴とする請求項1又は請求項2に記載の液晶表示ユニット。

【請求項4】 前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも2辺には、前記前枠の前方に配置され前記液晶パネルを支持するための装置本体から突出した突起を貫通させるための押通孔が少なくとも2箇所に配設されていることを特徴とする請求項3に記載の液晶表示ユニット。

【請求項5】 前記液晶表示パネルを少なくとも2枚有する前記液晶ユニットにおいて、前記液晶表示パネルが互いに対向する面の周辺部にスペーサを介装した請求項1又は請求項2又は請求項3又は請求項4に記載の液晶表示ユニット。

【請求項6】 前記スペーサをスponジで形成した請求項5に記載の液晶表示ユニット。

【請求項7】 前記スペーサをウレタンゴムまたはP E T材やP C材等で形成したことを特徴とする請求項5に記載の液晶表示ユニット。

【請求項8】 前記スペーサを不織布で形成した請求項5に記載の液晶表示ユニット。

【請求項9】 前記スペーサを両面接着テープで形成した請求項5に記載の液晶表示ユニット。

【請求項10】 照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニット

と前記液晶表示パネルとを配設した液晶表示ユニットと前記装置本体に組付けた液晶表示装置において、前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチを設け、前記前枠用フックに前記キャッチを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化し、前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成し、前記装置本体から突出した突起を前記挿通孔に貫通させて前記挿入孔に当接し、前記照明ユニットと前記突起をねじ止めすることで、前記液晶表示ユニットを前記装置本体に支持させたことを特徴とする液晶表示装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、パチンコ台などの遊技用表示モニターやお風呂場に設置されるモニターやドアホンモニターや工場設備のモニター等にみられるところの液晶表示ユニット及び液晶表示装置に関する。

【0002】

【従来の技術】液晶表示パネルにより画像を表示する液晶表示装置は、従来のプランウン管を用いて画像を表示する表示装置に比べて、軽量、小形、薄型、低消費電力が得られ易いため、表示装置としてモニター機器等の多方面に用いられている。

【0003】従来のこの種の液晶表示装置は、図14に示すように少なくとも液晶表示パネル84と照明ユニット85とを前側枠86-1と後側枠86-2の内に収納して成る液晶表示ユニット87を、取付け板(装置本体)88にねじ止めして大略構成してある。

【0004】この場合、前記液晶表示ユニット87の前側枠86には、図15及び図16に示すように、その面部80の上、下側縁部にそれぞれ一对の片状の取付部81を備えており、また、面部80の裏側には、観視窓82の左、右方に位置させて取付ボス部83が突設である。また、照明ユニット85の左、右側部位にはねじ孔89が形成してある。ねじ孔89に挿入したねじ部材90を取付ボス部83にねじ止めすることで照明ユニット85を前側枠86に取付ける。また、液晶表示ユニット87は、その取付部81のねじ孔81Aに挿入したねじ部材91を取付け板88にねじ止めして取付け板88に取付けてある。

【0005】

【発明が解決しようとする課題】上記した従来例にあっては、液晶表示ユニット87を取付け板88に取り付けるにあたって、その前側枠86に設けた取付部81を用いてのねじ止めであり、また、液晶表示ユニット87を組立てるにおいて、照明ユニット85の前側枠86への取付けを、照明ユニット85のねじ孔89に挿入したねじ部材90を取付ボス部83にねじ止めする方法を用い

ており、液晶表示ユニット87の取付け板88への取付け部の構成は、構成的に複雑になると共に、組み付けに工数を要するという問題点があった。

【0006】また、従来の液晶表示ユニット87が有する取付け部81の張り出しに対するスペースが必要になるために、取付け板88に、複数の液晶表示ユニット87を横の並べて取り付ける場合に、隣り合う液晶表示ユニット87の間隔を広くしなければならず、より多くの液晶表示ユニット87の取り付けができないという問題点があった。

【0007】

【課題を解決するための手段】上記の課題を解決するための本願の特徴は、照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットにおいて、前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチを設け、前記前枠用フックに前記キャッチを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化したことを特徴とする。

【0008】また、前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成したことを特徴とする。

【0009】また、前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも2箇所の隅には、前記照明ユニットを支持する照明ユニット支持部が配設されていることを特徴とする。

【0010】また、前記液晶表示パネルと前記照明ユニットが収納される前記前枠の収納部の少なくとも2辺には、前記前枠の前方に配置され前記液晶パネルを支持するための装置本体から突出した突起を貫通させるための押通孔が少なくとも2箇所に配設されていることを特徴とする。

【0011】また、前記液晶表示パネルを少なくとも2枚有する前記液晶ユニットにおいて、前記液晶表示パネルが互いに対向する面の周辺部にスペーサを介装したことを特徴とする。

【0012】また、前記スペーサをスポンジで形成した。また、前記スペーサをウレタンゴムまたはP E T材やP C材等で形成したことを特徴とする。また、前記スペーサを不織布で形成したことを特徴とする。また、前記スペーサを両面接着テープで形成したことを特徴とする。

【0013】かかる構成により、後側枠を用いずに直接、照明ユニットを前枠に取り付けてユニット化してお

り、前記前枠用フックに前記キャッチを掛合せすることにより行うことができて、ねじ止めの場合に比べて構成的に簡素になると共に、組み付けが容易になる。

【0014】また、照明窓を有する照明前側枠に、少なくとも蛍光管と導光部材とを収納した照明後側枠を係止手段により互いに係止して成る照明ユニットと、液晶表示パネルと、前記液晶表示パネルに表示された画像を観視するための観視窓と装置本体に組み付けるための組付け部とを有する前枠とを有して、前記前枠に前記照明ユニットと前記液晶表示パネルとを配設した液晶表示ユニットを前記装置本体に組付けた液晶表示装置において、前記照明後側枠に前枠用フックを設け、前記前枠に前記前枠用フックに掛合するキャッチを設け、前記前枠用フックに前記キャッチを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化し、前記組付け部を、前記前枠の前記観視窓が位置する面部の側部に設けられた挿通孔と、前記照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成し、前記装置本体から突出した突起を前記挿通孔に貫通させて前記挿入孔に当接し、前記照明ユニットと前記突起をねじ止めすることで、前記液晶表示ユニットを前記装置本体に支持させたことを特徴とする。

【0015】かかる構成により前記前枠用フックに前記キャッチを掛合せることにより照明ユニットを前枠に取り付けてユニット化している。このため後側枠を除くことが出来、ねじ止めの場合に比べて構成が簡素になると共に、組み付けが容易になるばかりか、液晶表示ユニットを装置本体に取り付ける場合に、装置本体から突出した突起を挿通孔に貫通させて挿入孔に当接し、照明ユニットと突起をねじ止めすることにより行うことができて、従来の液晶表示ユニットが有する取付け部の張り出しに対する余分なスペースが不要になって、装置本体に、複数の液晶表示ユニットを横の並べて取り付ける場合に、隣り合う液晶表示ユニットの間隔を狭くして、より多くの液晶表示ユニットの取り付けを可能にすることができる。

【0016】

【発明の実施の形態】以下、本発明の実施の形態を図面に基づいて説明する。図1は本発明に係わる液晶表示ユニットの一部省略した分解状態の斜視図である。なお、図面においてX1-X2を前後方向、Y1-Y2を左右方向及びZ1-Z2を上下方向とする。

【0017】本発明に係わる液晶表示ユニットNは、前枠1と、第1の液晶表示パネル(補正セル)5とスペーサ2と第2の液晶表示パネル(駆動セル)3Aを有する液晶パネル表示ユニット3と、照明ユニット4により大略構成してある。そして、この液晶表示ユニットNは、例えば、工場設備等の装置用パネル68(図12)に装着されて、液晶パネル表示装置としてモニタ用に使用されている。

【0018】また、前記前枠1には、その面部1aの中央部に、観視窓としての長方形状の画像表示窓部1Aが形成してある。この画像表示窓部1Aの前面側には風防ガラス1Bが嵌めてある。

【0019】そして、前枠1は、図2乃至図6に示すように、その面部1aの上、下縁部に連なる上、下面部1b、1cと面部1aの左、右縁部に連なる左、右面部1d、1eとを有していて、上面部1b及び左、右面部1d、1eのそれぞれの端縁部には、それぞれ一対の係止片部11A、11B、12A、12B、13A、13Bが形成してあり、これらの係止片部11A、11B、12A、12B、13A、13Bには係止穴11a、11b、12a、12b、13a、13bが形成してあり、これらでキャッチャ11、12、13を構成している。

【0020】また、前記前枠1の面部1aの裏面側には収容部61が設けてある。この収容部61は、前記面部1aの裏面側を、前記画像表示窓部1Aの前、後方に位置する上、下側部位14A、14Bと、前記画像表示窓部1Aの左、右方に位置する左、右側部位14C、14Dとし、また、上側部位14Aと左側部位14Cとが成す角部を第1の角部15A、上側部位14Aと右側部位14Dとが成す角部を第2の角部15B、下側部位14Bと左側部位14Cとが成す角部を第3の角部15C、下側部位14Bと右側部位14Dとが成す角部を第4の角部15Dとした場合に、第1の角部15Aに第1、第2位置決めピン部16、17を、第2の角部15Bに第3、第4位置決めピン部18、19を、第3の角部15Cに第5、第6位置決めピン部20、21を、第4の角部15Dに第7、第8位置決めピン部22、23をそれぞれ突設して構成してある。

【0021】また、第3の角部15Cにはピン状スペーサ部24が、また、前記左側部位14Cの上下にはピン状スペーサ部25、26がそれぞれ突設してあり、また、前記上側部位14Aの左右には弾性スペーサ係止用ピン部27、28が突設してある。

【0022】また、左側部位14Cの上下には挿通孔29、30が、右側部位14Dの上下には挿通孔31、32がそれぞれ設けてあり、前枠1の面部1aの裏面の3つに隅角部には受け部33A、33B、33Cがそれぞれ設けてあって、これらの受け部33A、33B、33Cとピン状スペーサ部24、25、26で照明ユニット4を支持し、第1～第8位置決めピン部16～23で液晶パネルユニット3を支持し位置決めする構成をなしている。

【0023】また、前記弾性スペーサ2は、図7に示すように板状の発泡ウレタンのようなスponジ材を長方形状の枠状体にプレス打ち抜きして成形してあり、その上側部位35は幅広に成されていて、この上側部位35の左、右には係止孔36、37が形成してある。この弾性スペーサ2の材質は、発泡ウレタンのようなスponジ

材に限らず、ウレタンゴム、不織布であってもよいし、弾性スペーサ2自体を両面接着テープで構成してもよい。

【0024】前記液晶表示ユニット3は、液晶表示パネル3Aと、液晶表示パネル3Aの駆動制御部3Bとを備えている。また、液晶表示パネル3Aは、上透明基板3aと下透明基板3bとの間に液晶物質(図示せず)を封入したものである。また、液晶表示パネル3Aには信号電極駆動回路部39Aと走査電極駆動回路部39Bとがそれぞれ設けてある。そして、信号電極駆動回路部39Aと走査電極駆動回路部39Bに駆動制御信号を供給するためのフラットケーブル(FPC)41が液晶表示パネル3Aの透明基板に接続してある。

【0025】また、第2の液晶表示パネル3Aに接続された端子と反対側のFPC41の端子は、第2の液晶表示パネル3Aの駆動制御用の電子部品(図示せず)が実装された基板42に接続してある。

【0026】照明ユニット4は、図1及び図8乃至図11に示すように蛍光管(図示せず)と導光部材(図示せず)と拡散板4Bとプリズムシート4Aとを、内面が反射処理された照明後側枠50に収納し、この照明後側枠50の前方に、照明窓44Aを有する照明前側枠44を配設すると共に、照明後側枠50と照明前側枠44とが係止手段(フックとキャッチャ)で互いに係止されて構成してある。

【0027】そして、照明前側枠44Lと右側部位44Rの上下に切欠き部46、47、48、49がそれぞれ形成してある。また、前記照明後側枠50の前面部の左側と右側の上下には前記切欠き部46、47、48、49に合致した形状の突起部51、52、53、54がそれぞれ形成してある。そして、これらの突起部51、52、53、54には挿入孔51a、52a、53a、54aが形成してあり、突起部51、52、53、54の裏はねじ座部51b、52b、53b、54bに成されている。また、前記照明後側枠50の裏面には基板42をねじ止めするための3本のボス部43が設けてある。

【0028】また、照明後側枠50の上端面部50Aには、前枠係止用フックとしての係止突起55、56が左右に設けてあり、照明後側枠50の左、右端面部50C、50Dには、上下に位置させて前枠係止用フックとしての係止突起57、58、59、60が設けてある。

【0029】そして、前枠1の収容部61に第1の液晶表示パネル5が収容してある。この場合、第1の液晶表示パネル5の第1の角部5Aが前枠1の第1の角部15Aの第1、第2位置決めピン部16、17により、第1の液晶表示パネル5の第2の角部5Bが、第2の角部15Bの第3、第4位置決めピン部18、19により位置決めされる。また、第1の液晶表示パネル5の第3の角部5Cが第3の角部15Cの第5、第6位置決めピン部20、21により位置決めされる。また、第1の液晶表

示パネル5の第4の角部5Dが第4の角部15Dの第7、第8位置決めピン部22、23により位置決めされる。

【0030】そして、第1の液晶表示パネル5に重ねてスペーサ2が設けられて、このスペーサ2の上側部35の左、右の係止孔36、37にスペーサ係止用ピン部27、28が挿入係止される。

【0031】そして、第2の液晶表示パネル3Aが第1の液晶表示パネル5にスペーサ2を介して重ねて前枠1に装着される。この場合、前枠1のキャッチャ11の係止穴11a、11bに照明ユニット4の前枠係止用フックとしての係止突起55、56が、キャッチャ12の係止穴12a、12bに照明ユニット4の前枠係止用フックとしての係止突起57、58が、キャッチャ13の係止穴13a、13bに照明ユニット3の前枠係止用フックとしての係止突起59、60がそれぞれ係止される。

【0032】そして、第2の液晶表示パネル3Aの表側に接続されたFPC41が折り曲げられて下方に導出して、基板42が照明ユニット4の裏側に重ねられ、基板42の下側縁部の左右に設けられた取付部(図示せず)をねじ部材(図示せず)により照明後側枠50のボス部43にねじ止めしてユニット化してある。

【0033】そして、このようにユニット化された液晶表示ユニットNは装置本体68にねじ止めされる。すなわち、この装置本体68には、図12に示すようにその面部68Aの中央部に長方形形状の画像表示窓部69が形成してあり、装置本体68の、画像表示窓部69を中心とした左、右側部位には、上下に位置させて突起70が突設してあり、これら突起70の端面にはねじ孔71が設けてある。

【0034】そして、液晶表示ユニットNの前枠1の挿通孔29、30、31、32に装置本体68の突起70を挿入して装置本体68の裏側に液晶表示ユニットNを沿わせる。次に、照明後側枠50に配設されたねじ座部51b、52b、53b、54bと突起70の端面のねじ孔71とが、照明後側枠50に配設された挿入孔51a、52a、53a、54aに挿入したねじ部材72で、ねじ止めされる。このようにして液晶表示ユニットNが前記装置本体68にねじ止めされて液晶表示装置が構成される。この場合、装置本体68の面部68Aの画像表示窓部69に前記前枠1の画像表示窓部1Aが重なる。

【0035】

【発明の効果】以上の如く、本発明に係わる液晶表示ユニットによれば、照明後側枠に前枠用フックを設け、前枠に前記前枠用フックに掛合するキャッチャを設け、前記前枠用フックに前記キャッチャを掛合することで前記照明ユニットと前記液晶表示パネルとをユニット化したことにより、照明ユニットを前枠に取り付けてユニット

化する場合、前記前枠用フックに前記キャッチャを掛けすることにより行うことができて、ねじ止めの場合に比べて構成的に簡素になると共に、組み付けが容易になる。

【0036】また、装置本体に液晶表示ユニットを組付けるための組付け部を、前枠の前記観覧窓が位置する面部の側部に設けられた挿通孔と、照明ユニットに設けられて前記挿通孔の後方に配設された挿入孔とから構成し、前記装置本体から突出した突起を前記挿通孔に貫通させて前記挿入孔に当接し、前記照明ユニットと前記突起とをねじ止めすることで、前記液晶表示ユニットを前記装置本体に支持させたことにより、液晶表示ユニットを装置本体に取り付ける場合に、装置本体から突出した突起を挿通孔に貫通させて挿入孔に当接し、照明ユニットと突起をねじ止めすることにより行うことができて、従来の液晶表示ユニットが有する取付部の張り出しに対する余分なスペースが不要になって、装置本体に、複数の液晶表示ユニットを横の並べて取り付ける場合に、隣り合う液晶表示ユニットの間隔を狭くして、より多くの液晶表示ユニットの取り付けを可能にすることができる。

【図面の簡単な説明】

【図1】本発明に係わる液晶表示ユニットの分解状態の斜視図である。

【図2】同液晶表示ユニットの前枠の正面図である。

【図3】図2のA方向からの矢視図である。

【図4】図2のB方向からの矢視図である。

【図5】図2のC方向からの矢視図である。

【図6】同液晶表示ユニットの前枠の裏面図である。

【図7】同液晶表示ユニットの弾性スペーサの正面図である。

【図8】同液晶表示ユニットの照明ユニットの正面図である。

【図9】図8のD方向からの矢視図である。

【図10】図9のE方向からの矢視図である。

【図11】図9のF方向からの矢視図である。

【図12】本発明に係わる液晶表示装置の取付状態の斜視図である。

【図13】同液晶表示装置の取付状態の断面図である。

【図14】従来の液晶表示装置の断面図である。

【図15】同液晶表示装置の前枠の斜視図である。

【図16】同液晶表示装置の前枠の裏側から見た斜視図である。

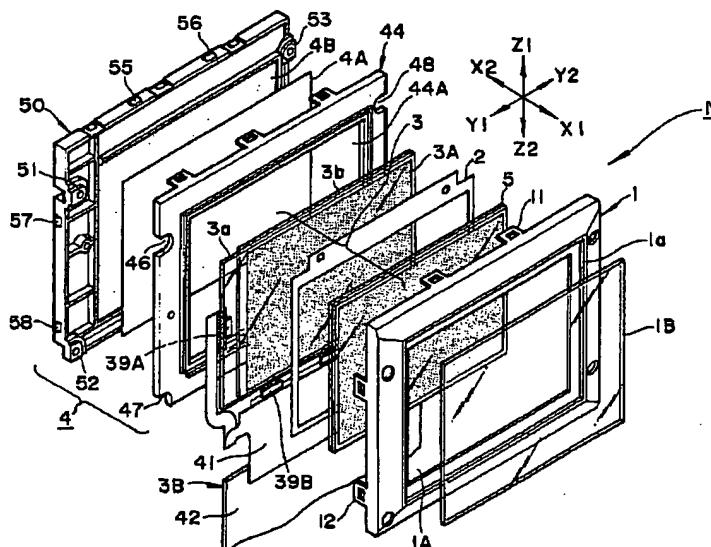
【符号の説明】

- 1 前枠
- 2 弹性スペーサ
- 3 液晶表示パネル
- 3A 第2の液晶パネル
- 4 照明ユニット
- 5 第1の液晶パネル

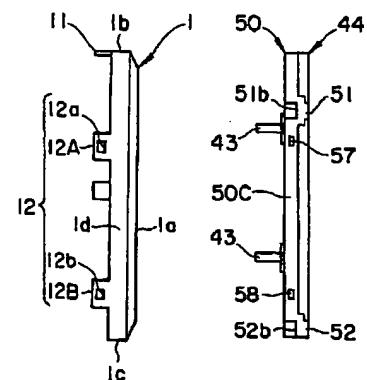
11、12、13 キャッチャ
29~32 挿通孔
50 照明後側棒
51a~54a 挿入孔

55～60 係止突起（前枠係止用フック）
68 装置本体
70 突起
N 液晶表示ユニット

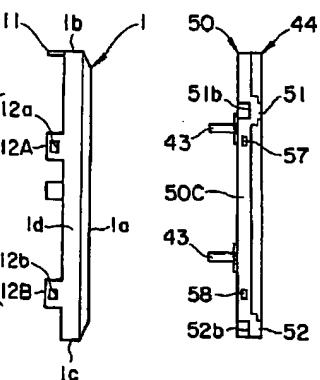
【図1】



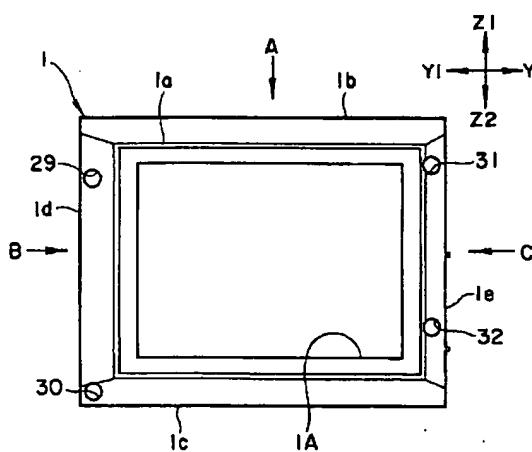
【図4】



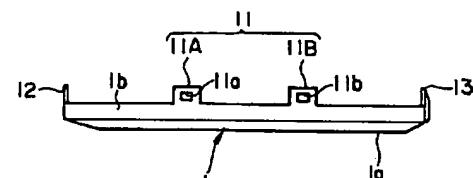
【図10】



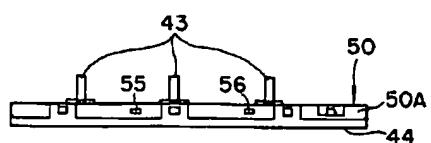
【図2】



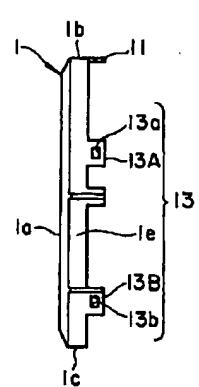
〔図3〕



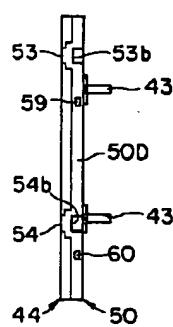
〔図9〕



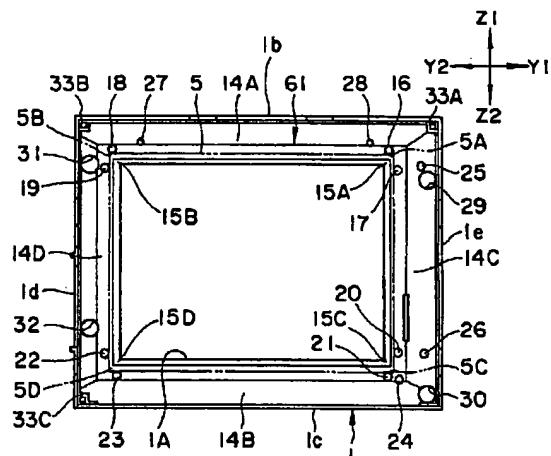
〔図5〕



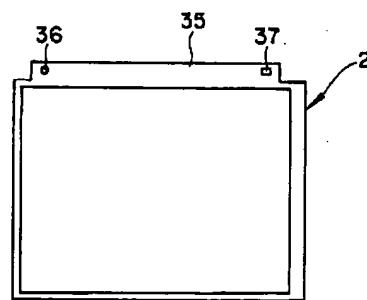
[図11]



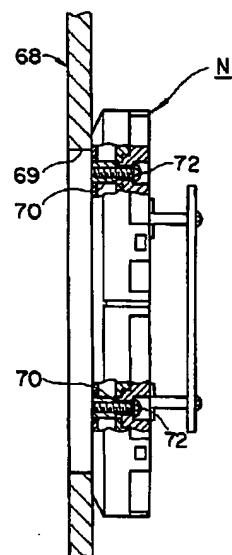
【図6】



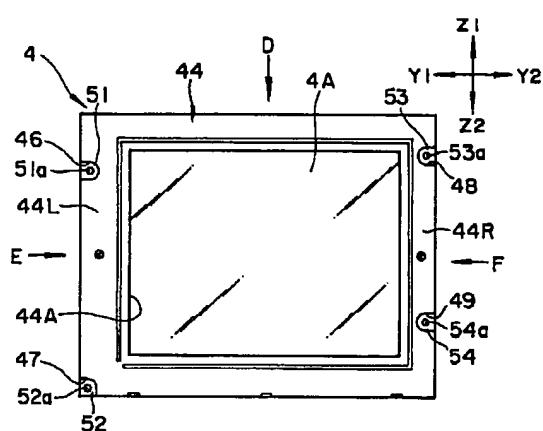
【図7】



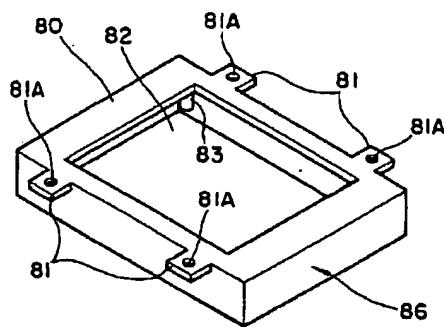
【図13】



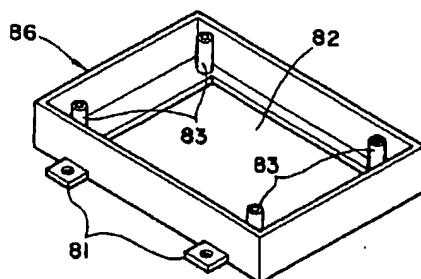
【図8】



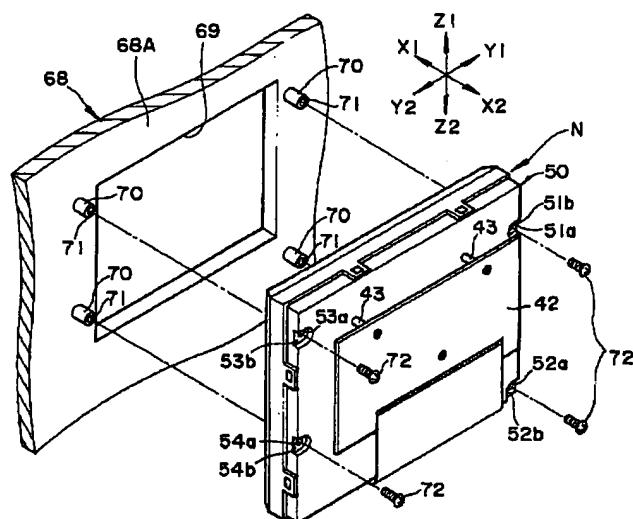
【図15】



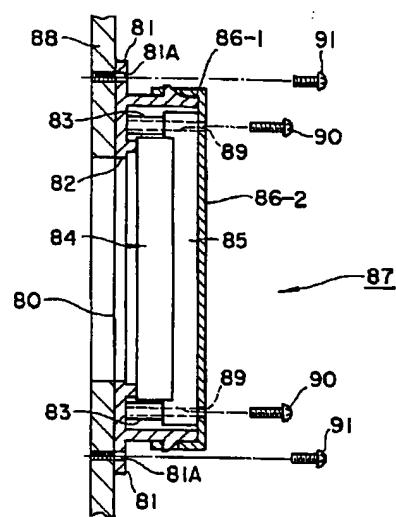
【図16】

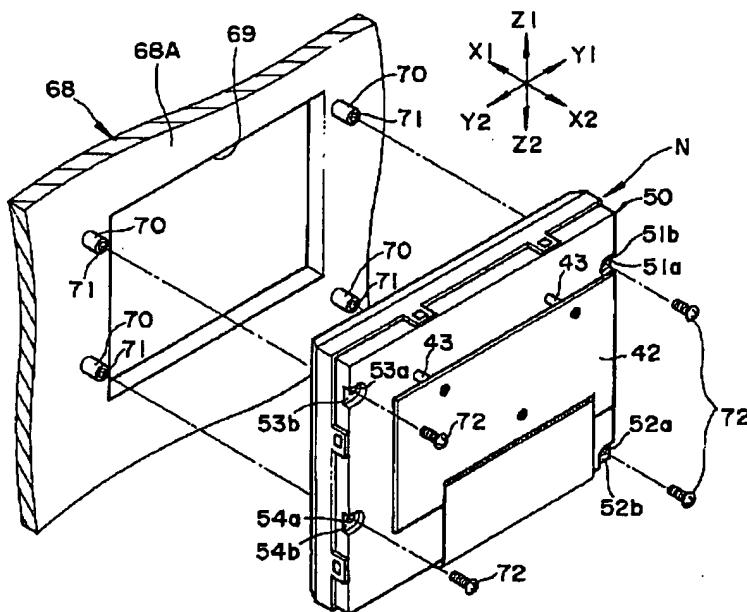


【図12】

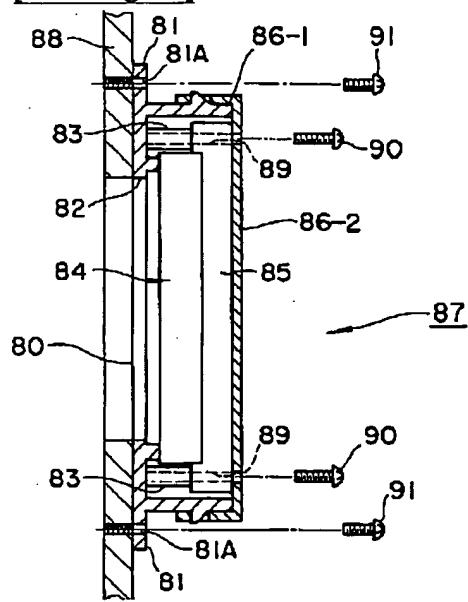


【図14】





[Drawing 14]



[Translation done.]